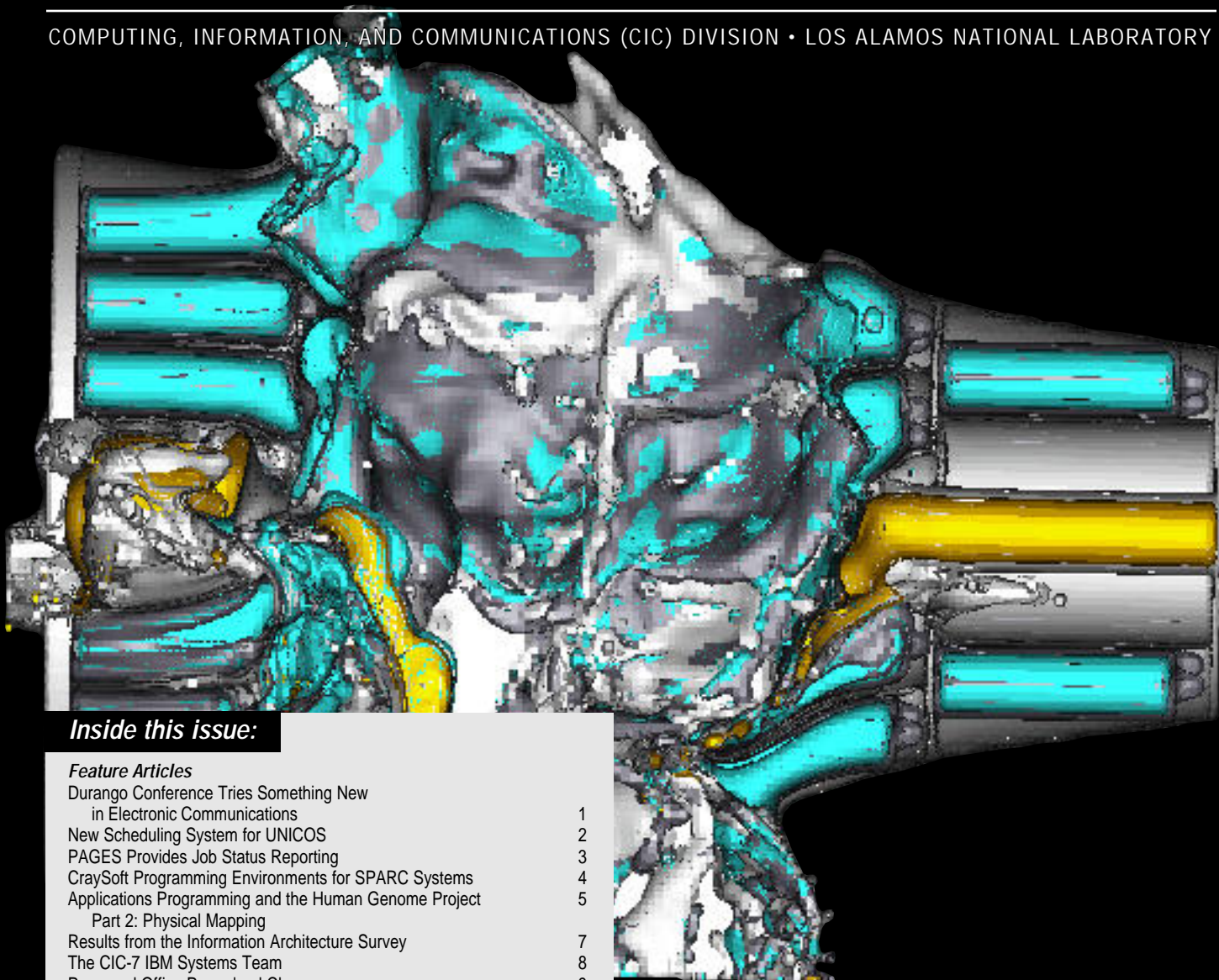


# BITS

## computing & communications news

AUGUST 1995

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY



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*The Ballistic Missile Defense Organization has funded Los Alamos and Lawrence Livermore National Laboratories to examine the concept of developing a hypervelocity, kinetic-energy kill vehicle (KKV) that would intercept theater missiles in their ascent phase, a concept previously considered too costly or technically infeasible. Shown above in the hydrocode simulation is a KKV impacting an idealized chemical submunition target. The initial velocity of the KKV is 8 km/s and the crossing angle is 80 degrees. This simulation was run with PAGOSA, a second-order-accurate, 3D Eulerian hydrodynamic computer program that runs on a massively parallel Connection Machine (CM-200) at Los Alamos. This work is being conducted by L. A. Schwalbe, J. J. Jacoby (both of X Division), and K. F. Schoenberg (P Division).*

# CIC Customer Service Center . . . . . (505) 665-4444 or cichelp@lanl.gov

## Integrated Computing Network (ICN)

### Consulting:

Centralized scientific and engineering computing .....consult@lanl.gov or 7-5746

Lab-wide administrative and business systems .....labwide@lanl.gov or 7-9444

Passwords (required for access to ICN) .....validate@lanl.gov or 5-1805

Systems documentation (local and vendor supplied) .....7-6992

Central Computing Facility (CCF) .....7-4584

Advanced Computing Laboratory (ACL) .....5-4530

Local Area Network (LAN) system administration services .....5-2220

Desktop Support Center (DSC) .....7-4357 (7-HELP)

(PC Help for IBM and Macintosh personal computers)

For questions about PC software: PCSW-help@lanl.gov or 7-5884

For questions about PC hardware: PCHW-help@lanl.gov or 7-9372

For questions about Mac software: MacSW-help@lanl.gov or 5-1361

For questions about Mac hardware: MacHW-help@lanl.gov or 7-6459

Telephone Services Center .....7-3400

(includes voice mail)

## Computer training

Lab-wide systems support training .....7-9444

Computer/workstation training .....7-9399

Personal computer training .....7-9071

Microcomputer support facility seminars .....7-4357

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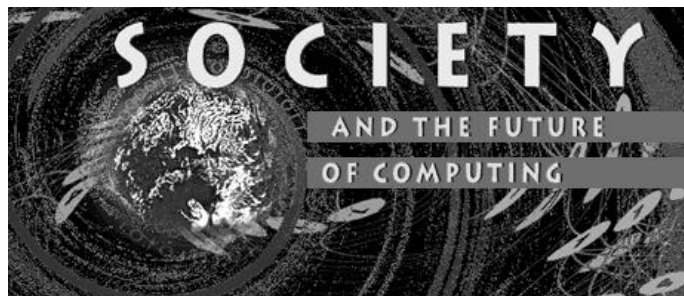
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## Durango Conference Tries Something New in Electronic Communications



A team of people from CIC and Public Affairs (PA) made the first Society and the Future of Computing Conference a huge success and broke new ground in communication as well. The conference, SFC '95, held in Durango, Colorado, June 11-14, 1995, included over 40 invited speakers/panelists, 5 keynote speakers, and attendees from all over the United States. Following a suggestion made by PA-1's Jim Danneskiold, speakers' quotes, conference photographs, and summaries of the keynote speeches and panel discussions appeared on the Web immediately following each session. Danneskiold, CIC personnel, and student "fellows" at the conference were responsible for getting the materials out on the Web in this timely manner. Carlos Cabildo and Joe Kleczka of CIC-2 handled the connections to the Internet, and Jim Cruz of CIC-1 helped students prepare the digital photos for transmission. This "up-to-the-minute" coverage of the conference can still be seen on the Web at URL

**<http://www.lanl.gov/LANLNews/Conferences/.sfc95/sfcHome.html>**

The Web site also includes hyper-news links for readers to participate in interactive commentary on the future of computing in education, commerce, government, and society as a whole.

Cabildo and Kleczka set up and operated an extensive "e-mail room" so that the 165 conference attendees could send and receive electronic mail as easily as if they were at their own desktops. The e-mail room housed 13 workstations, including Suns, IBM PCs, and Macs, all networked to each other and to two printers. The CIC-2 personnel also installed the necessary Internet connections for thirty-three poster presentations, allowing on-line demonstrations at each poster booth. Anthony Rendon of CIC-1 coordinated, shipped, and set up all the

equipment required in the poster hall. Cruz designed and produced all of the conference materials, signs, and Web-page graphics and operated an interactive graphics station for each session throughout the conference.

Ann Mauzy of CIC-1 edited the conference materials and helped perform the HTML formatting necessary to put the materials on the Web. Biographies of keynote speakers (including CIC Division Director Hassan Dayem) and panelists, along with abstracts of sessions and posters, appeared on the conference Web pages weeks ahead of the conference to generate enthusiasm for the subject and attract attendees. At the conference, the attendees informed conference organizer and co-chair Rick Light of CIC-7 that they felt it was important to meet annually to discuss computing and its interrelationships with society, and they asked that Los Alamos once again organize and sponsor the conference.

The conference was an initiative of the U.S. Public Policy Committee of the Association for Computing Machinery (ACM) in cooperation with the University of Maryland Human-Computer Interaction Laboratory and the ACM subgroups SIGCAS, SIGCHI, SIGSOFT, and SIGCAPH. CIC Division of LANL was the organizing and sponsoring institution. Ben Shneiderman of the University of Maryland and Light were the conference co-chairs. The program committee included Chair Phil Agree of UC San Diego, Dan Kerlinsky of UNM, Rob Kling of UC Irvine, Barbara Simons of IBM and ACM, Rick Weingarten of Computer Research Association, and Andy White of LANL. The Laboratory's organization of the conference was assisted by Jan Hull and Pat Fierro of PA-4. Additional funding for the conference was provided by MCI Government Systems, Cray Research, Inc., IBM POWERParallel Division, and the Advanced Technology Group of Apple Computer, Inc.

The unusual mixture of disciplines, ranging from telemedicine to digital libraries to economics to government to home life, stimulated some lively discussions on the future of computing and society. Many attendees commented that this multidisciplinary approach was refreshing and that through it they were able to understand new sides of issues. As a result of the conference, a number of follow-on research agendas and guidelines for future projects that take into account the impact of technology on society are now underway.

If you would like to become involved in SFC '96, please contact conference organizer and co-chair Rick Light at 505-667-0744 or [rxl@lanl.gov](mailto:rxl@lanl.gov).

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Communication Arts and Services Group (CIC-1)

## New Scheduling System for UNICOS

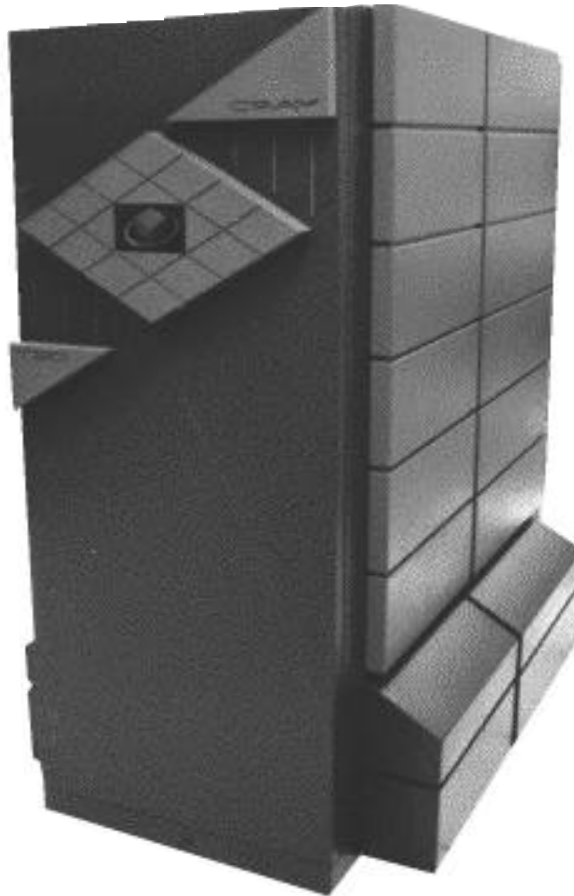
On August 8, the Computing Group (CIC-7) plans to begin using a new locally developed CPU scheduling algorithm, known as Opportunity Scheduling. This new system will be installed on machine delta, a Cray computer within the Integrated Computing Network (ICN). If the new scheduler proves to be superior to Fair Share (the former scheduling system), Opportunity Scheduling will be installed on epsilon this September and on all other ICN UNICOS machines by the end of the year. This article summarizes the differences between Opportunity Scheduling and Fair Share and describes the mechanisms by which users may control the allocation of cycles under the new scheduler.

Opportunity Scheduling was developed in response to requests from Los Alamos users for more direct control over the interactive responsiveness of the ICN Cray machines. Opportunity Scheduling differs fundamentally from Fair Share in many of its design goals, such as the following:

- Opportunity Scheduling allocates computing opportunity—CPU at this point in time—rather than aggregate cycles over longer periods of time. Unlike Fair Share, no attempt is made to track usage or to adjust service based on past usage.
- Like Fair Share, CPU resources are divided among political organizations sharing a single computer. However, under Opportunity Scheduling these shares are not further subdivided among the organization's individual users. Instead, all active processes in a resource group, or "bank," compete directly with one another for that bank's share of the machine.
- Opportunity Scheduling supports priority bidding among processes within banks via the "nice" mechanism. Log-on sessions begin at nice 30; users may adjust the nice value for any of their processes to a high-priority value of nice 21 or to a low-priority value of nice 38. Each nice increment results in a 20% service adjustment relative to other processes in the same bank. Nice 39 is also available; processes run at standby, yielding the CPU to any higher-niced process irrespective of bank. Note that nice 20 is no longer available.
- Memory scheduling has been enhanced so that it can be influenced by CPU priorities. Processes from banks that have used more than their bank's share of core memory will be preferentially swapped out to disk should system swapping become necessary.

Under Opportunity Scheduling, production jobs (batch work submitted via the PROD system) will run in a special bank. PROD jobs will have no impact on a user's ability to compute interactively; the workload from one bank does not influence the performance of processes in another bank.

The PROD bank will receive a small allocation during normal working hours (at this writing, 5%) and receive the bulk of the machine during off-hours (85%). In practice PROD jobs will receive more than these allocations, as cycles from idle banks are distributed to those banks with available work.



Since the resource granted to a process depends on both the share given to its bank and the presence of other processes within that bank, Opportunity Scheduling users have two ways in which to influence the scheduling of their work.

1. Users may gain a larger share of their bank's allocation, at the expense of fellow bank members, by increasing the priority (decreasing the nice value) of their processes or by increasing the number of active processes on a job (multitasking). The Opportunity Scheduling system makes no attempt to control bank usage; users must police their own groups. To assist with this, we have enhanced the INQUIRY utility (-b and -B options) to display utilization rates for all processes in a given bank. At a future date, bank managers will be given the ability to alter the nice values of any process within their bank and to limit nice ranges for their users.

2. Users of a bank may also petition management to increase the share of the machine allocated to their bank or to change their bank affiliation.

Unfortunately, Opportunity Scheduling does not create more computing resource; relative to Fair Share, some users will benefit from its policies while others will be hurt. The objective of Opportunity Scheduling is simply to give users direct control over their computing opportunity. By adjusting nice values and relative shares, a user organization can ensure that interactive cycles are allocated to its most important work.

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## PAGES Provides Job Status Reporting

A World Wide Web interface is now available for querying the status of jobs sent to PAGES (Printing And Graphics Express Station). This service allows you to see what jobs you have in the queue, when they were printed, what options were requested, etc. You can query by Z-number, job number, or PAGES queue name. To access this new service, point your Web browser at the following URL:

**[http://pages-sv.lanl.gov/pages\\_status.html](http://pages-sv.lanl.gov/pages_status.html)**

For more information on CIC-17 Media Services, including PAGES, Copy Center, and Government Printing Office and Scanning services, enter the following URL:

**<http://pages-sv.lanl.gov>**

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# CraySoft Programming Environments for SPARC Systems



Cray Research, Inc., is now providing SPARC versions of compilers, tools, and libraries that have historically been available only on its PVP (parallel vector processors) platforms (e.g., Y-MP, C-90, T-90, and J-90). These new software products, distributed by the CraySoft division of Cray, use the same interface found on larger Cray systems but are designed for workstations.

A tar file containing the 1.0.2.0 version of the CraySoft SPARC products has been placed on the Common File System (CFS). This tar file contains the same contents as the CD-ROM available from CraySoft distribution. The following Cray software packages for SPARC systems are contained in this release:

- Cray SPARC FORTRAN 90 Compiling System
- Cray SPARC LibSci Scientific Libraries
- Cray SPARC Programming Tools
- Cray Distributed Programming Environment
- Cray Network Queuing Environment
- Cray Open Storage Manager
- CrayDoc

The name of the tar file is

**cs102a.tar**

and it is located in CFS directory

**/craysoft/CraySoft/1.0.2.0**

This CFS directory will contain the latest releases of CraySoft products in use at Los Alamos. Although we will post information about changes to this directory in BITS, you may also want to check the directory from time to time to see what's available. To get this file, execute the following:

```
cfs get /craysoft/CraySoft/1.0.2.0/cs102a.tar  
tar -xvf cs102a.tar
```

The tar file of the complete product set, cs102a.tar, is 229 megabytes in size, so remember to place it in a location that has enough disk space for both the tar file and its extracted contents. If your system does not have this much space available, let us know and we will loan out one of the available CD-ROMs. To install the appropriate software, review the installation guide that came with your original distribution. If you have any problems, please contact Bob Boland or Wayne Vieira.

Tar files for some of the individual CraySoft products are available in subdirectories beneath

**/craysoft/CraySoft/1.0.2.0**

For example, to get only the CraySoft CF90 Programming Environment, execute the following:

```
cfs get /craysoft/CraySoft/1.0.2.0/f90/f90.tar  
tar -xvf f90.tar
```

These CraySoft products are being installed on CFS as a part of an agreement between Los Alamos and CraySoft, which includes special multilicense pricing. If you are interested in obtaining CraySoft software through this licensing arrangement, contact Bob Boland. For more information about CraySoft see their home page at

**[http://www.cray.com/PUBLIC/productinfo/craysoft/CraySoft\\_Home.html](http://www.cray.com/PUBLIC/productinfo/craysoft/CraySoft_Home.html)**

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# Applications Programming and the Human Genome Project

## Part 2: Physical Mapping

Physical maps are to the Human Genome Project (HGP) what geographic maps were to the early explorers—guides into an unknown territory often constructed along the way. Like most globes, physical maps are very effective for showing the locations of major landmarks, but they lack high-resolution details. For physical maps, these details include such things as sequences within a mapped gene or specific distances between landmarks (see Figure 1).

According to Robert Sutherland, “Physical maps allow us to know exactly where fragments fit within the chromosome, plus or minus a few hundred thousand nucleotides.” Robert Sutherland and Catherine Beauheim (both of CIC-12) provide applications support for LANL’s HGP effort in physical mapping.

Rather than sequencing the entire chromosome 16, LANL scientists have decided to use a combination of low-pass sample sequencing and high-resolution physical mapping to decipher the genetic code. Physical maps allow researchers to rapidly locate genes and chromosomal areas of interest. High-resolution mapping efforts and additional guided sequencing can then focus on those areas.

### Gathering Data

Using System for Integrated Genome Map Assembly (SIGMA) software, written by Michael Cinkoski and Michael Bridgers (both formerly of T-10), Robert assists LANL scientists in constructing physical maps of chromosomes 16 and 5. These maps are developed with data from various characterization techniques including grid hybridization experiments.

Grid hybridizations help locate the position of clones on larger pieces of DNA. Hybridization experiments label known DNA sequences and use the labeled sequences to probe for complementary sequences in a chromosome. Labels are normally radioisotopes that can be detected by exposure to x-ray film. Here at LANL, a robot developed by Pat Medvick and Tony Beugelsdijk (both of ESA-MT) stamps high-density membranes for hybridizations using a series of 16 plates of 96 clones each. After these membranes are prepared, hybridizations are performed using radioactively labeled probes, and the membrane is exposed to x-ray film. A transparent grid is placed over the exposed film and researchers mark the clones on the grid with a colored-in circle to score the level of the match between the clone and the problem. These data are individually and manually entered into a database.

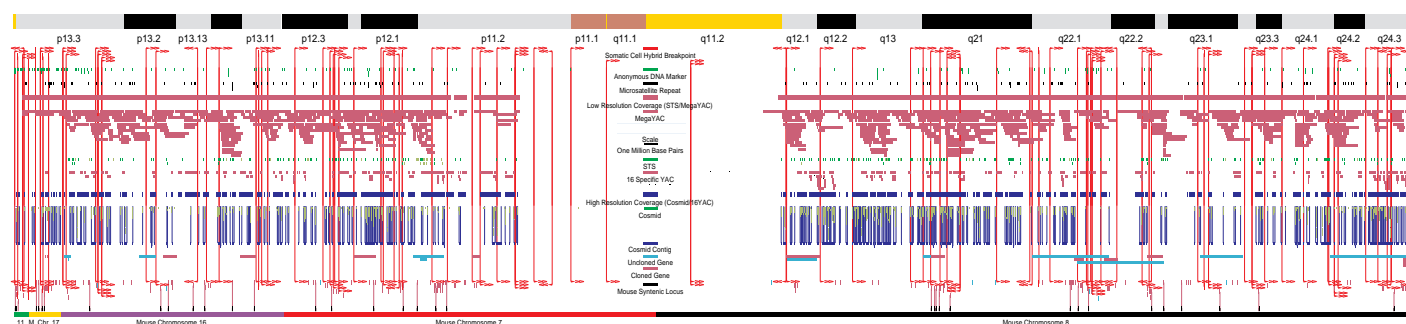


Figure 1. Physical Map

## GridHYB: Speeding Data Collection and Analysis

To speed up data input and analysis for grid hybridization experiments, Catherine developed gridHYB, an automated data analysis system connected to a mapping database. GridHYB displays the digitized image of a hybridization and generates, by interpolation, a grid on top of the image (see Figure 2). The grid is used to locate the signals on the image and can be manipulated by the user. The image is read to calculate the intensity of the image at the set grid locations; a score from 0 to 4 is suggested. The biologist will review the data, accept or edit the computer's suggestions, interactively adjust the scoring ranges, and lastly, save all the information to the database with the push of a button.

### Making the Maps

Armed with data from grid hybridizations and other mapping techniques, Robert works with SIGMA and the mapping database to sift through data and construct integrated physical maps. SIGMA's database stores all basic data from both internal and external sources, whether the data are consistent or not. SIGMA's physical maps, on the other hand, display the best fit of data to the map as determined by the editor.

Over the years, Robert has developed a process for taking new data and comparing them with existing experimental data that are present within the chromosome maps to determine best fits. As part of this process, Robert must resolve data conflicts, decide what data to keep or leave out, and eliminate potential redundancies caused by varying nomenclature among labs. Once a best fit has been made, areas where high-probability matches occur are targeted for closer examination. Recently this process of examining large amounts of data, analyzing them for areas of high correlation, and then testing them for matches has really paid off for LANL.

In the course of his mapping work, Robert has helped uncover hundreds of unexpected fragments, or YACs (named as such because they were cloned via yeast artificial chromosomes), within chromosome 16. Other laboratories working on the HGP had originally localized 39 YACs to chromosome 16. Since then LANL has mapped an additional 700 YACs, contributing 93% of the total found. Building on this, LANL researchers have discovered 190,000 overlaps, 40,000 fragments, and 300 rogue DNA segments, for a total coverage of 98% of chromosome 16. Similar progress has been made with chromosome 5, for a total of 80% coverage of the short arm.

"The numbers only increase," says Robert, who took over LANL's production of physical maps two years ago. "Considering chromosomes 5 and 16 make up only 9 percent of the total human genome, there's plenty more to do."

The Applications Programming Group (CIC-12) provides the Lab with short- and long-term programming support that spans all platforms and technologies. CIC-12 services include software development; database design, development, and maintenance; basic research tools and programming support; graphics coding; data visualization; and applied supercomputing. For more information, contact Gary Clark at 5-4613.

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(505) 665-3656  
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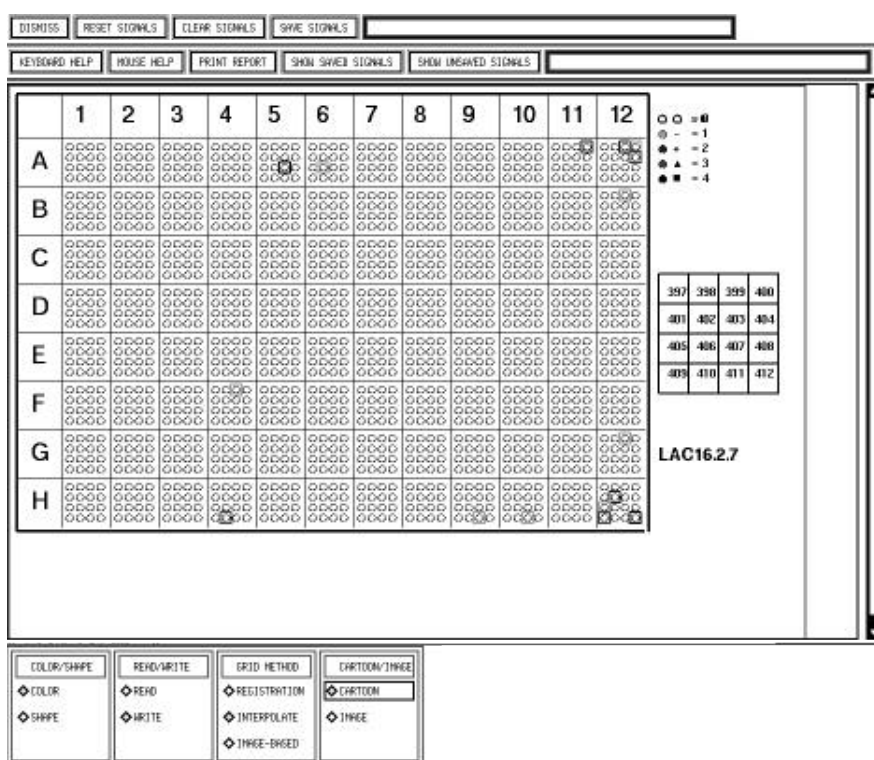


Figure 2. GridHYB Display



## Results from the Information Architecture Survey



Results from the Information Architecture (IA) survey conducted in March 1995 are now available. If you need a printed copy or electronic mail copy of the survey results contact Diana Tuggle (667-8691 or [dst@lanl.gov](mailto:dst@lanl.gov)).

The Information Architecture (IA) project at Los Alamos is a blueprint for the planning and coordination of Laboratory-wide computing, information, and communications activities. The IA project, endorsed by the LLC, is chartered to replace the current evolutionary and somewhat disjointed computer communications system at the Laboratory with an architecture that provides seamless availability to all types of information.

Before adopting standards, the IA project needed to know what computer tools and services Laboratory personnel were currently using. In response to this need the IA project conducted a survey to give Laboratory personnel the chance to have input.

The IA Metrics Team distributed 625 surveys to a representative sample of Laboratory employees and contractors selected randomly by job category. The survey asked about desktop computers, operating systems, software, e-mail, the Internet, computer-support services, computer training, and satisfaction with and importance of these tools and services. About 40% of the recipients responded, providing an error rate of plus or minus 8%. The TSM, SSM, and OS/GS job categories each provided about one fourth of the responses with TECs making up 14% and contractors 12%.

Survey responses project two major themes: (1) LANL employees use many kinds of computers and software packages and (2) there are no absolute de facto standards; however, there are a few favored computers and software packages throughout the Lab.

How will IA use the survey results? One thrust of IA is establishing guidelines and standards in areas affecting information access and management. The IA needed to know what is in use, what is important to users, and the level of satisfaction before adopting standards and guidelines. The IA project will also use the survey findings to establish a base line for measuring improvement in Lab-wide computing and information sharing.

If you would like to look at or comment on proposed guidelines and standards, they are available on-line through Gopher/World Wide Web under "Computing at LANL/Information Architecture Project/Proposed Guidelines and Standards." Contact Tad Lane (667-0886 or [tad@lanl.gov](mailto:tad@lanl.gov)) for additional information. You may also subscribe to the IA distribution list for e-mail notifications of new RFCs (requests for comment) by sending e-mail to "[listmanager@lanl.gov](mailto:listmanager@lanl.gov)" and entering "subscribe info-arch@lanl.gov" in the body of the e-mail message.

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## The CIC-7 IBM Systems Team

The IBM Systems Team is chartered to provide production system support for Laboratory-wide administrative computing via an IBM 9021-580 mainframe computer. The applications we support are available under the "IB" option on the services menu. IB applications include, among others, the Financial Management Information System; Property Accounting, Inventory, and Reporting System; Time and Effort System; Automated Chemical Inventory System; and Hazardous Material Transfer Tracking System. Support for the IB applications is available twenty-four hours a day, seven days a week. It is our job to ensure that the IBM 9021-580 is responsive, secure, and reliable regarding data integrity. We provide the computational resources to process Laboratory-wide information along with high-speed access to the information residing on storage devices.

### Improving Access to Administrative Systems

One of our goals is to improve accessibility to Laboratory-wide administrative systems. We accomplished part of this goal by providing access via smartcards for customers on LANL open networks. (This project was a collaborative effort with CIC-5 and the Password Office.) These customers can now use TELNET to access IB administrative systems from their open workstations. In addition, we are currently reengineering some processes on the IBM 9021-580 that will enable customers to use vendor connectivity software. For example, customers can now use PC/TCP or MAC/TCP (with a TN3270 emulator) for direct access to IB applications. We view this approach as a replacement for the PCINFORM and SLINFORM services.

### Expanding Access to Administrative Systems

We are also working with Business Information Systems (CIC-13) on technologies that will allow our customers to access administrative information stored on the IBM 9021-580 by using GUI (graphical user interface) clients. GUI products currently being used are PowerBuilder for client development and Sybase for connectivity and database access. Other Sybase products that are being used include Net Gateway, Open Server/CICS, and Open Server/DB2. A future project, based on the Open Software Foundation's Distributed Computing Environment, is being planned with Distributed Computing (CIC-8).

### Parallel Computing for Administrative Systems

We continually evaluate future hardware and software technologies that will improve the service we give our customers. One such technology, the System/390 Enterprise Server, will enable LANL to enter the world of parallel computing for commercial applications. This technology will allow our customers to gain the performance advantages of parallel computing and to participate in open, client/server networks using a new IBM 9672-R53. CIC-7 plans to install this machine in September 1995. This installation is the first step toward providing a platform that will support parallel administrative computing at LANL.

Look for future BITS articles that provide information about changes to the services provided by the IBM Systems Team. If you have any questions or comments on the services we provide, please contact Hal Armstrong, Team Leader.

Hal Armstrong, hga@lanl.gov, (505) 667-8426  
Computing Group (CIC-7)

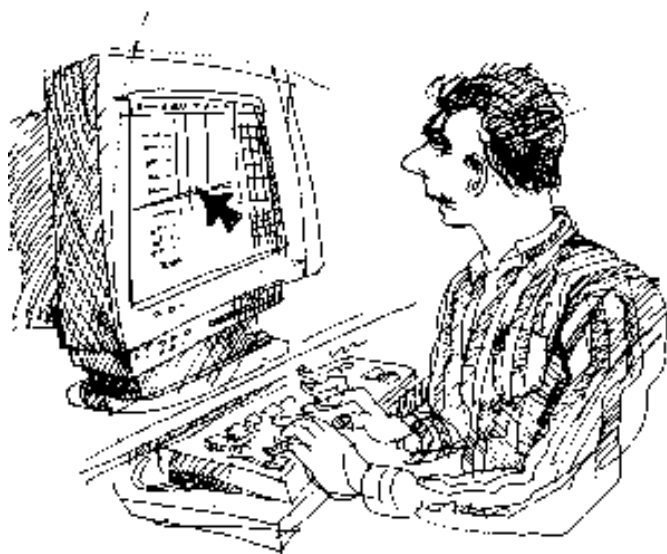


## Password Office Procedural Change

When processing ICN accounts, the Password Office will obtain user organization, mail stop, and other status information from the Employee Information System (EIS). This new procedure will eliminate duplicate data entry, ensure consistency, and speed up the processing of ICN accounts. This procedure will become effective within the next few weeks.

As part of this procedure, new users applying for an ICN account must be entered into the Directory Information System (DIS) before their ICN accounts can be opened. For existing ICN users, location and other status information must be current so that password renewals are sent to the correct address and ICN access is not interrupted.

If you are in a position, such as group secretary, in which updating DIS is your responsibility, please follow the guidelines below to ensure efficient processing of ICN accounts. If you do not have access to DIS but are concerned that your DIS information may need updating, please contact your group secretary or whoever is responsible for maintaining your EIS information and ask him or her to verify the accuracy of that information for you.



## Guidelines for Processing ICN Accounts

- **Processing ICN Accounts for New Users:** The first step for obtaining an ICN account is to complete an ICN Validation Request form. This form requires approval from the group leader or other authorized person. During this approval process, verify that the status information of the new user (employee, contractor, or associate) is in DIS and that this information is accurate. If this information is not complete and correct, please make it so. This verification step is important because incorrect DIS information will delay the opening of the ICN account.
- **Processing ICN Accounts for Existing Users:** As for new users, verify that the status information of the existing user (employee, contractor, or associate) is in DIS and that this information is accurate. In particular, review contractor and associate termination dates since ICN access will be interrupted if their contracts have expired.
- **Processing ICN Accounts for External Users:** If you are the LANL contact for an external ICN user, verify that the status information of the external user is in DIS and that this information is accurate.

## Where to Get Help

- Contact the Password Office for information on procedural changes that affect the processing of ICN accounts: (505) 665-1805 or [validate@lanl.gov](mailto:validate@lanl.gov).
- Contact Lab-Wide Systems for information about DIS: (505) 667-9444 (extension 2) or [labwide@lanl.gov](mailto:labwide@lanl.gov).
- Contact the Customer Service Center for general information about CIC services: (505) 665-4444 or [cichelp@lanl.gov](mailto:cichelp@lanl.gov)

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## CFS—Recursive List (Revised)

Last month's Tips from the Consultants article, CFS—Recursive List, was published with incomplete information. This revised article contains the correct information.

The six CFS (Common File System) commands LIST, GET, DELETE, REMOVE, RESCUE, and MODIFY permit the use of recursion when .R is appended to the command name. A recursive request starts at the root or branch and performs its operation on all paths in the tree.

Care must be taken in defining the path and format of the information requested because the results could easily be misinterpreted. While wild cards may be used with both the subdirectory and file elements, the recursive nature of these commands can cause confusion.

To illustrate the use of .R functions, assume a small root called "index". A recursive list reveals the following structure:

```
?l.r lf=o /index
/index      GU      95/06/13    8006x33p 7d
sbysubject  GU      88/01/08    unix disk 34,457
sbytitle    GU      88/09/20    unix disk 41,991
ssubjects   GU      86/08/29    o/s? disk 1,394
sub1/       GU      95/06/13    ld
xx          GU      91/08/09    unic disk 50
sub2/       GU      95/06/13    ld
xx          GU      91/08/09    unic disk 50
sub3/       GU      95/06/13    ld
xx          GU      95/06/13    unix disk 50
xxx         GU      93/11/01    unic disk 14,263
?
```

The use of the lf=o (one line per file) option presents a misleading representation of the structure. Note that sub1 and sub2 have a file named xx within them. Note also that sub3 appears to have a file xx and xxx. If this same structure is viewed using the lf=op option, in which "p" provides the specific subdirectory relationships, the actual structure becomes apparent:

```
?l.r lf=op
/index
/index GU 95/06/13 8006x33p 7d
/index/sbysubject
sbysubject GU 88/01/08 unix disk 34,457
/index/sbytitle
sbytitle GU 88/09/20 unix disk 41,991
/index/ssubjects
ssubjects GU 86/08/29 o/s? disk 1,394
/index/sub1
sub1/ GU 95/06/13 ld
/index/sub1/xx
xx GU 91/08/09 unic disk 50
/index/sub2
sub2/ GU 95/06/13 ld
/index/sub2/xx
xx GU 91/08/09 unic disk 50
/index/sub3
sub3/ GU 95/06/13 ld
/index/sub3/xx
xx GU 95/06/13 unix disk 50
/index/xxx
xxx GU 93/11/01 unic disk 14,263
?
```

The file xxx is actually directly under the root index; it appeared misplaced only because of the alphabetized nature of the listing.

LIST.R does not function as a UNIX FIND command except for the purpose of locating subdirectories (as distinct from files). The command

```
list.r filename
```

will not search an entire tree and report those paths that contain filename. However, this capability can be achieved using wild cards, but each level within the tree must be specified, for example:

```
list lf=po *string* /*string* ...
```

To list recursively a directory structure only, use the option lo=d as in the following command:

```
?l.r lf=op lo=d
/index
/index GU 95/06/15 8006x33p 7d
/index/sub1
sub1/ GU 95/06/15 2d
/index/sub2
sub2/ GU 95/06/15 1d
/index/sub3
sub3/ GU 95/06/15 1d
?
```

A recursive delete using wild cards is shown in the following example:

```
?delete sub*/x*
deleted /index/sub1/xx 06/13 14:37
deleted /index/sub2/xx 06/13 14:37
deleted /index/sub3/xx 06/13 14:37
```

The ability to find a file in a tree structure requires the “piping” of the output of the CFS command as input to the UNIX GREP command as follows:

```
%cfs list.r lo=s lf=p | grep zz
/index/sub1/sub1.a/zz 06/16 15:26
zz file size: 50 bytes
```

The other .R commands include the following:

- GET.R, DELETE.R, and RESCUE.R work for “files” at all levels of a subtree.
- MODIFY.R is performed for every “node” of the subtree.
- REMOVE.R removes only subdirectories that are empty and only the lowest level subdirectory of each path each time REMOVE.R is executed. Therefore, it may be necessary to execute REMOVE.R multiple times to prune a multilevel tree.

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Customer Service Group (CIC-6)

## CFS Gateway Enhancements

Desktop users of the Common File System (CFS) should see the ICN changes section of this issue for a description of recent enhancements.

## Mathematica on the Cluster

The CIC Cluster Team now supports Maple and Mathematica on the Open Cluster. These two vendor systems provide numerical and symbolic computations and include very powerful capabilities for visualization. In this article, we will present some of the features of Mathematica; in a later one, a similar discussion of Maple will be given. In conversations with Laboratory scientists and engineers, there is a diversity of opinion on the relative merits of these two systems. We have found both to be very powerful and a great boost to productivity.

### What Is Mathematica?

Mathematica is a software system for numerical, symbolic, and graphical computations and visualization. Engineers, scientists, financial analysts, researchers, professors, and college and high school students worldwide apply Mathematica to critical projects for reliable answers. Mathematica delivers to users an interactive calculation tool and versatile programming language for fast and accurate solutions to technical problems. Mathematica's electronic documents, called notebooks, let you easily organize your text, computations, graphics, and animations for impressive technical reports, courseware, presentations, or records of your work. And you can use MathLink, Mathematica's communication protocol, to exchange information between Mathematica and other programs. Mathematica is available on over 20 computer platforms.

### Numerical Computation

Mathematica will perform numerical computations as soon as you type your first equation on the screen. These computations include:

- Arbitrary-precision numbers
- Higher mathematical functions (elliptic, hypergeometric, etc.)
- Matrix operations (inverses, eigenvalues, etc.)
- Fourier transforms
- Function fitting
- Integration
- Root finding
- Differential equations
- Minimization and linear programming
- Number theoretical functions

### Symbolic Computation

Mathematica functions like a symbolic calculator for computations that range from simple to complex, such as:

- Algebraic simplification
- Polynomial factoring
- Indefinite integration
- Symbolic differential equation solving
- Algebraic equation solving
- Symbolic matrix operations
- List processing

### Graphics and Sound

Mathematica offers a visualization and sound generation system for functions and data; output includes:

- Function and data plots
- 2D, 3D, contour, and density plots
- 3D object visualization
- Lighting models
- High-level graphics description language
- PostScript output
- Animated graphics (most versions)
- Sampled sound from functions and data (some versions)

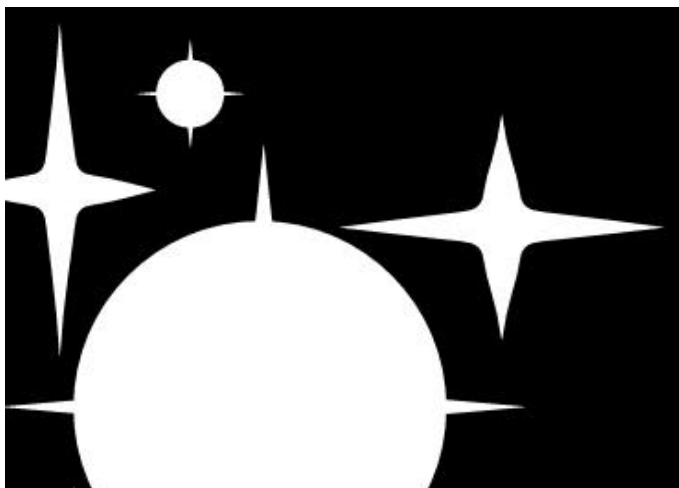
### Connecting to Mathematica with MathLink

MathLink lets you easily unite the capabilities of Mathematica with those of other programs and applications in your computing environment. MathLink provides seamless connections between Mathematica, your own programs, and many MathLink-capable applications. The open architecture of MathLink allows you to design your own client/server systems that incorporate Mathematica and other programs so you can handle a wider variety of problems. By eliminating the need to switch back and forth between applications, MathLink also helps you work more efficiently. With MathLink, you can

- call another program from Mathematica,
- call Mathematica from another program, or
- call one or more Mathematica kernels from another Mathematica kernel.



You can use MathLink to have Mathematica communicate with other programs either on the same machine or between computers that are connected on a network. For example, you may be working in an Excel spreadsheet on a Macintosh and have Excel access a copy of Mathematica running on a workstation. The Mathematica notebook front end communicates to the Mathematica kernel via MathLink, whether on a single computer or across a network between different computers. Since MathLink code handles the details of interprocess communication, the same code can be used across a network, making it easy for developers to write their own MathLink connections. In addition, because many commercial programs already support MathLink, you don't have to be a programmer to benefit from it.



also makes it easy to use Mathematica to manipulate and graph data accessed directly from your lab experiment or your corporate database. Typically, the lab hardware or database comes with a library of specialized functions that access the information. With MathLink, you can install these functions into the Mathematica kernel and use them just as you would any other Mathematica function.

### Put MathLink to Work for You

Below are some examples of how you can incorporate Mathematica into your professional toolbox using MathLink.

#### Call an External Program from Mathematica

You can call your own specialized algorithms, functions, or optimized C or FORTRAN programs from Mathematica via MathLink with only minimal changes, if any, to your original program. Once you create a simple MathLink template file identifying the functions you wish to call from Mathematica, MathLink creates the C code for the connection automatically. Your template file is not platform-specific, so you can easily transfer your link to different kinds of computers. This is an excellent way to quickly and easily extend Mathematica's capabilities for your needs or to use Mathematica as a sophisticated interface or analysis and visualization environment for your program. MathLink template files make transferring your data structures to and from Mathematica a simple task. Or they can help you establish Mathematica as a control language to integrate a variety of primitive routines across a network. MathLink

#### Call Mathematica from Another Program

A short MathLink program is all that is needed to call the Mathematica kernel from external programs. In this way, you are free to concentrate on your program, calling on Mathematica's functionality when desired as if it were a subroutine. MathLink works just as easily with commercial applications that are designed to support external "add-ins," such as the popular Microsoft Excel spreadsheet program. Say, for example, you are working on an Excel spreadsheet and you need to perform some special functions not available in Excel, such as solving differential equations numerically. Mathematica can handle this alone, but you may not want to quit Excel to finish your project. Using a MathLink-based add-in for Excel written by Wolfram Research, Excel can directly call Mathematica, and Mathematica instantly becomes an extension of Excel. Work is sent out to Mathematica, the computation is completed, and the results are sent back to your Excel spreadsheet.

#### Put Several Mathematica Kernels to Work for Faster Results

Concurrent processing on several machines using MathLink is straightforward. If you have a problem that requires more computing power than a single machine can supply, you can use MathLink to connect multiple Mathematica kernels or other MathLink-capable programs and access the power of several machines at once. You can then divide the problem into various parts, assigning each to the program and/or machine that will handle it most efficiently.

## MathLink-Compatible Applications

With MathLink, you can conveniently complete tasks that require the specialized capabilities of both Mathematica and any of a broad range of commercial applications. Most of the MathLink programs for these connections are available free of charge from MathSource, Wolfram Research's electronic resource for Mathematica-related materials such as packages and notebooks. Here are a few of the programs that are currently MathLink-compatible.

**Microsoft Excel:** The MathLink add-in for Excel (Microsoft Excel Version 4.0 or higher on Windows or Macintosh) gives Excel spreadsheet users additional computing power. The addin allows users to call Mathematica from an Excel spreadsheet to make immediate use of hundreds of Mathematica functions or to write Excel macros that incorporate Mathematica's concise and powerful programming language. (The MathLink add-in for Excel is available separately from Wolfram Research for \$50.)

**LabVIEW:** VIs (virtual instruments) for LabVIEW 3.0 (laboratory control and data acquisition system) use MathLink to enable LabVIEW users to pipe data through Mathematica for advanced analysis and visualization. (The VIs are available on MathSource and from National Instruments.)

**Visual Basic:** Since MathLink on Microsoft Windows is implemented as a dynamic link library (DLL), users of the Visual Basic programming language can incorporate Mathematica into their custom applications.

**Spyglass Transform:** With MathLink, Transform (data visualization software) can now take advantage of Mathematica's extensive set of functions to manipulate scientific data sets. (Transform is available from Spyglass.)

**AVS (application visualization system):** MathLink modules for AVS enable this visualization system to make publication-quality plots of its data using Mathematica. Users can also use Mathematica to generate or transform additional data. (The modules are available on MathSource.)

Additional MathLink programs are also available on MathSource.

## MathLink Comes with Mathematica

MathLink is a standard part of the Mathematica kernel. In addition, everything you need to make your own MathLink connections—such as MathLink libraries, interface files, tools, and example programs—is included as a standard component for most Mathematica packages. The MathLink Reference Guide, also included, gives you a practical introduction to MathLink and instructions for creating MathLink-capable applications. Using MathLink, Mathematica's open-architecture design enables you to easily integrate the power of Mathematica with your other applications in a single streamlined environment.

To obtain more information about Mathematica, point your Web browser at

**<http://www.wri.com>**

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Distributed Computing Group (CIC-8)

**LANL Research Library Training**

The LANL Research Library provides training for using its specialized databases. Training sessions begin at times indicated below. Classes are scheduled for half an hour, except for "Information Resources on the Internet via Gopher/WWW" which is two hours. Space is limited to 8 per session. Classes are free, but you must pre-register by calling the Research Desk at 7-5809 or sending E-mail to [ref@lanl.gov](mailto:ref@lanl.gov); no registration required for the "Library Orientations" class. Special classes and orientations can also be arranged.

Date	(Time)	Subject Matter
8-1-95	(1:00 p.m.)	Physics/Weapons Resources
8-3-95	(1:00 p.m.)	Business Sources on the WWW*
8-8-95	(1:00 p.m.)	GeoRef (Geology Literature, 1785 to present)
8-9-95	(11:00 a.m.)	MEDLINE
8-10-95	(10:00 a.m.)	Info Sources on the Internet via WWW (Gopher searching upon request)
8-15-95	(1:00 p.m.)	Commercial Information for Patent Applications
8-16-95	(11:00 a.m.)	MELVYL (U. of CA databases)
8-17-95	(1:00 p.m.)	Science Sources on the WWW*
8-22-95	(1:00 p.m.)	Math/Sci (Math & Computer Science Literature)
8-23-95	(1:00 p.m.)	Bioscience and Biotechnology Resources
8-24-95	(10:00 a.m.)	Info Sources on the Internet via WWW (Gopher searching upon request)
8-24-95	(1:00 p.m.)	Chemical Abstracts (selected portions)
8-29-95	(1:00 p.m.)	Engineering/Materials Resources
8-30-95	(11:00 a.m.)	MELVYL (U. of CA databases)
8-31-95	(1:00 p.m.)	Science Citation Index

\* Requires working knowledge of a Web browser.

## Lab-Wide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

### Course Registration

You must have a valid "A" or "U" level ICN password before taking any of the courses shown in the table. To register for a course, call CIC-6 Training, Development, and Coordination section at 667-9444 or send E-mail to [classes@lanl.gov](mailto:classes@lanl.gov). You will be sent a registration form to be completed and returned.

Course Title	Date	Time	Cost	Course Number
<b>ALL-IN-ONE Basic Electronic Messaging</b>	<b>Scheduled Upon Request</b>		<b>\$410</b>	<b>Course #6882</b>
	Participants receive hands-on instruction to create, read, and print electronic mail. Participants also learn how to edit mail, create distribution lists, send mail to a FAX machine, and grant mail access to others. Prerequisite: an ICN password and an account on the OFVAX.			
<b>Automated Chemical Inventory System (ACIS):</b>	<b>Scheduled Upon Request</b>		<b>\$410</b>	<b>Course #7480</b>
	Participants receive hands-on instruction to update the status (end-user, location, quantity) of chemical containers. Participants will also learn to generate chemical inventory reports by chemical name, end-user, location, and organization.			
<b>Budget Computing System (BUCS):</b>	<b>8/21/95</b>	<b>8:30 – 12:00</b>	<b>\$410</b>	<b>Course #3527</b>
	This training is an introduction to the Budget Computing System (BUCS). Students practice generating "quick reports" and reports requiring parameter files. An introduction and demonstration of (no "hands-on") allocating and forecasting procedures are given during the three-hour session.			
<b>Directory Information System (DIS):</b>	<b>Scheduled Upon Request</b>		<b>\$410</b>	<b>Course #7072</b>
	Lab-wide customers responsible for maintaining the Laboratory directory in the Employee Information System will receive hands-on instruction to update Laboratory employees, update and add non-Laboratory employees, retrieve location and address information for any employee, and print reports.			
<b>Employee Development System - Basic Training (EDS I):</b>	<b>8/9/95</b>	<b>8:30 – 12:00</b>	<b>\$410</b>	<b>Course #5289</b>
	The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.			
<b>Employee Development System - Training Plans (EDS II):</b>	<b>8/23/95</b>	<b>8:30 – 12:00</b>	<b>\$410</b>	<b>Course #7155</b>
	Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).			
<b>Eudora Electronic Mail for Macintosh Users</b>	<b>Scheduled Upon Request</b>		<b>\$205</b>	<b>Course #9762</b>
	This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.			

Course Title	Date	Time	Cost	Course Number
Eudora Electronic Mail for PC Users	Scheduled Upon Request		\$205	Course #9763
	This is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.			
Facilities Project Information/Work Orders (FPI/WO):	Scheduled Upon Request		\$410	Course #6996
	Lab-wide users with a need to view the status of work orders and tickets in their organizations will receive hands-on instruction to request, print, and review work order, ticket and project summary information reports.			
Financial Management Information System (FMIS):	Scheduled Upon Request		\$410	Course #8338
	Participants receive hands-on instruction to "explode" and "transfer" through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.			
Hazardous Materials Transfer Tracking System for Nonradioactive Material (HMTTS/NRAM):	Scheduled upon request		\$410	Course # 7907
	Participants receive hands-on instruction to create, update, and print the non-RAM Hazardous Materials Transfer Form (HMTF). Attendees must have completed "Completing the HMTF for Non-RAM," course #7512, sponsored by HS-8.			
Hazardous Materials Transfer Tracking System for Radioactive Material (HMTTS/RAM):	Scheduled Upon Request		\$410	Course #7993
	Participants receive hands-on instruction to create, update, and print the Radioactive Materials Transfer Form (RMTF). Information about the non-RAM Hazardous Materials Transfer Form (HMTF) is included. This course is appropriate for people who fill out both RAM and Non-RAM forms. Attendees must have completed "Completing the RMTF," course #7517, sponsored by HS-8.			
Introduction to the Internet: Beginning Netscape	8/25/95	1:00 – 3:00	\$205	Course #10961
	Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.			
Introduction to LANL Information Systems:	8/11/95	8:30 – 11:30	Free	Course #10118
	This three-hour class is a hands-on introduction to the information systems available to Laboratory-wide users. The participants will become acquainted with Lab-wide information systems such as TRIPS and Stores, Electronic Mail, and Netscape (an interface to Laboratory information).			
Key/Core System	8/18/95	1:30 – 3:30	\$205	Course #10179
	Key custodians and alternate key custodians receive hands-on instruction to add, update, and delete key and padlock information, and view assignment information and request reports. Students will also learn how to request key inventory notifications. Students must be a key custodian or alternate and have an ICN password.			
Lotus Notes Basic Concepts	8/9/95	1:30 – 5:00	\$410	Course #9917
	This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.			

Course Title	Date	Time	Cost	Course Number
On-Line Forms	8/2/95	1:30 – 5:00	\$410	Course #9756
Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the “ICN Validation Request,” “Visitor Request for Unclassified Visits to Security Areas,” and “Request for Quotation.”				
Property Accounting, Inventory, and Reporting System (Advanced)	8/30/95	8:30 – 12:00	\$410	Course #9918
This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discusses. Participants should already have a basic understanding of and know how to use PAIRS.				
Secretarial/Contract Services (SE):	Scheduled upon request		\$410	Course #7481
This class provides hands-on instruction for creating secretarial requests for temporary services, entering time for technical and nontechnical contract employees, and creating reports using the Information Manager Utility. The students will also learn how to review notifications and approve attendance. A training database will be used for the class.				
Signature Authority System (SAS):	8/16/95	8:30 – 12:00	Free	Course #7582
Managers or their designees receive instruction to assign, view, and change signature authorities (purchase request, chemical purchase, and handling hazardous material). Participants will also learn how to generate and print authority reports for their organizations.				
STORES:	Scheduled upon request		\$410	Course #3529
Participants receive hands-on instruction to search for an item in the on-line catalog by key word, part number, or exact name. Participants learn how to select items from the catalog, and place, change and cancel an order. Several methods for reviewing orders are also taught including reviewing an order in detail, scanning all orders, and reviewing back-orders.				
Time and Effort System	Several August dates available		Free	Course #11018
The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will also be discussed. In addition, the student will learn how to use the Information Manager utility to view and print reports.				
Travel Reporting Information Planning System (TRIPS):	Scheduled upon request		\$410	Course #4369
Class participants receive hands-on instruction to prepare travel requests (TRs) on-line and learn the print, revise, and cancel options. The participants also learn how to use the on-line approval function. The various reports available in TRIPS-II are reviewed.				



## CIC Computing Classes

CIC offers a variety of computing courses for the professional development of Laboratory employees. The courses listed in Table 1 will meet at the time and the date shown. The date for courses in Table 2 are not known at this time.

## Course Registration

To register: (1) check the box beside the appropriate course, (2) complete the Enrollment Information section below, and (3) follow the mailing instructions on the back of this form. Submittal of a Course Registration form does not guarantee participation in an advertised class, but it is the only way to get into the queue for notification of upcoming classes. Classes are conducted in a secure area unless noted; uncleared participants require escorts. Call the Training Coordinator at 667-9399 for more information.

**Table 1 Courses with confirmed time and date**

COURSE TITLE	INSTRUCTOR	COST	DATES
<input type="checkbox"/> Fortran 90: Training	Walt Brainerd, President, Unicom, Inc.	\$1275-\$1775 (depending on enrollment)	8/29/95 through 9/1/95
<input type="checkbox"/> UNIX (Beginning)	Ted Spitzmiller & Jeffrey Johnson	\$810	9/11/95 through 9/15/95
<input type="checkbox"/> Visualizing Your Data with AVS	North Carolina Supercomputing Center personnel	\$1,014.50–\$1,367.50 (depending on enrollment)	8/22/95 through 8/23/95
<input type="checkbox"/> Writing AVS Modules	North Carolina Supercomputing Center personnel	\$1,14.50–\$1,367.50 (depending on enrollment)	8/24/95 through 8/25/95

**Table 2 Courses with date to be arranged (TBA)**

COURSE TITLE	INSTRUCTOR	COST	DATES
<input type="checkbox"/> C Programming (Beginning)	Boulder Software Group	\$1025-\$1450 (depending on enrollment)	TBA (5-day class)
<input type="checkbox"/> C Programming (Advanced)	Boulder Software Group	\$1025-\$1450 (depending on enrollment)	TBA (5-day class)
<input type="checkbox"/> SUN Solaris 1.X (SunOS 4.X) Advanced System Administration	Sun Microsystems Expert	\$1750-\$2000 (depending on enrollment)	TBA (4.5-day class)
<input type="checkbox"/> SUN Solaris 2.X System Administration	Sun Microsystems Expert	\$1750-\$2000 (depending on enrollment)	TBA (5-day class)
<input type="checkbox"/> Unigraphics	Polster CAD/CAM Services or comparable expert	\$1067.67–\$1250.00 (depending on enrollment)	TBA

Note: Detailed course descriptions for most classes provided on the following pages.

### Enrollment Information

Name \_\_\_\_\_

Phone \_\_\_\_\_ Z-Number \_\_\_\_\_

Group \_\_\_\_\_ Mail Stop \_\_\_\_\_

Program Code\* \_\_\_\_\_ Cost Code\* \_\_\_\_\_

Group Leader Signature \_\_\_\_\_

*\*Enter program code and cost code for all courses. If you need to withdraw from a class fewer than 5 working days before the class is scheduled to begin, your group will still be charged. Substitutes may be sent, but please let the CIC Division Training, Development, and Coordination Office (667-9399) know who your substitute will be.*

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Do Not Staple  
Fold on This Line First

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NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

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AND COORDINATION TEAM  
LOS ALAMOS NATIONAL LABORATORY  
PO BOX 1663  
LOS ALAMOS NM 87544-9916



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Fold Here

**C Programming (Beginning)**

Prerequisite: An understanding of the useful skills in a high-level programming language. A current ICN password is required.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Introduction and Fundamentals; Basic Semantic Constructs—Getting Started; Base Level I/O with C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools; and POSIX System Calls.

**C Programming (Advanced)**

Prerequisite: Useful skills and experience with the C Programming language.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Data Structures, Algorithms, and OOP; An Advanced Clinic for C Programmers; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; An Introduction and Overview of AT&T's C++ 3.0; and Appendix: references for periodicals, journals and texts.

**Fortran 90: Training**

Prerequisite: Competency in Fortran 77 and access to a Fortran 90 compiler following class. Access to ICN computer with Fortran 90 compiler.

Location: CIC-Secure Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Audience: Individuals who are using or will be using the ANSI standard Fortran 90 in the course of their business.

Topics: History/Overview/New Features; Procedures; Array Processing; Using Character Data; Pointers; Input/Output; and Language Architecture.

Note: All lecture topics will be punctuated with hands-on laboratory examples and opportunities for problem practice. Note: HP will supply 8 HP systems and associated software for laboratory practice.

## Unigraphics

Prerequisite: Drafting terminology and skills, do not need to know Unigraphics CAD/CAM but must be familiar with CAD/CAM concepts.

Location: CIC-CTI Classroom; TA-3, SM-200, Room 115.

Enrollment: Minimum 10, Maximum 16.

Audience: Engineers, technicians, and draftspersons who must work with CAD/CAM CAE systems to be able to share and modify information efficiently.

Topics Include: Getting Started; Features & Operations; Lines; Arcs & Circles; Edit Curve; Fillet & Chamfer; View; Layout; WCS; Layer; Swept Feature & Operations; Info; Form Features; Transform; More Curve Creation & Object Display; Edit Feature; Overview of Sketches; Preferences; Sketch; Sketch Curves; Constraining Sketches; Swept Features Using Sketches; Editing Sketch; and Assemblies.

## UNIX (Beginning)

Prerequisite: Familiarity with a UNIX workstation.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 8, Maximum 10.

Topics: Overview of the Workstation environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using basic system status commands; Startup and shutdown procedures; Using tar.

*Beginning UNIX—  
This course has  
been restructured  
to address generic  
UNIX information.  
There is no longer  
a focus on Sun  
operating systems  
and tools. Additional  
topics are being  
added. This course  
will probably  
be offered on a  
quarterly basis.*

## Visualizing Your Data with AVS

Prerequisite: Familiarity with UNIX and X Windows

Location: CIC-CTI Classroom, TA-3, SM-200, Room 115

Enrollment: Minimum 10, Maximum 15

Audience: Individuals who wish to visualize data using Application Visualization System (AVS 5.0); may bring own data sets

Topics: Introduction to Visualization; Introduction to AVS: Background, Architecture, Examples, International AVS Center, and Supported Hardware; Introduction to Geometry View, Introduction to AVS Data Types: Primitive, Field, Geometry, Image, UCD, and Volume; Commonly Used Modules/Networks; Advanced Network Editor; Graph/Data/Image Viewers; Importing Data into AVS; Strategies and Data File Formats; Commonly Used Data Input Modules; and, if attendees wish, Animation, Animation Modules and CLI Interface.

## Writing AVS

Prerequisite: Visualizing Your Data with AVS, or equivalent experience, UNIX and X Windows familiarity, C (preferred) or FORTRAN

Location: CIC-CTI Classroom, TA-3, SM 200, Room 115

Enrollment: Minimum 10, Maximum 40

Audience: Individuals who wish to create their own customized AVS 5.0 modules.

Topics: AVS Data Types: Primitive, Field, Geometry, UCD, and Color map; Module Writing I: Module concepts, Writing a subroutine module, and C and FORTRAN; Module Writing II: Examples, Debugging modules, and Co-routines; Module Generator: Module Structure and Options, I/O, Parameter types, and Widgets; and Module Development: Macro modules, AVS Libraries/Headers, Compiling Modules, and Platform Compatibility.

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### Change Control for August 1995

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### Schedule for Change Control

Date	Activity
August 1 (First Tuesday)	New or changed software is available in experimental ( <b>X</b> ) files on CFS for testing. This initial testing period is for uncovering problems in the software before the software is put into production. If you find a problem, please call the ICN Consulting Office at (505) 667-5746.
August 8 (Second Tuesday)	The changes become production version on <ul style="list-style-type: none"> <li>Machine <b>rho</b> (UNICOS)</li> <li>Distributed processor <b>beta</b> (ULTRIX)</li> <li>Distributed processor <b>ccvax</b> (VMS)</li> </ul>
August 15 (Third Tuesday)	If no problems are reported to the ICN Consulting Office (505) 667-5746, changes are installed on <ul style="list-style-type: none"> <li>Machine <b>gamma</b> (UNICOS)</li> </ul>
	The Department of Energy (DoE) has frozen software changes to the machines in the secure network. <b>X</b> files and executables will be placed on CFS as usual and users are encouraged to test these files. Executables will be installed in a staggered fashion when the freeze is lifted. The date for lifting the freeze is unknown. <ul style="list-style-type: none"> <li>Machines <b>delta</b>, <b>epsilon</b>, <b>tau</b>, and <b>zeta</b></li> </ul>

Note: A stop sign in front of a title is significant:

 = incompatible changes; please read!

## Changes



### CFS Gateway

#### Function

Network archival and file storage server.

#### Change

CFS has been the file archival system for the LANL network since 1979. To “talk” modern network protocols without extensively changing CFS’s code, the system was “front-ended” with a protocol conversion machine referred to as the CFS Gateway. Both the Gateway server program and the client code (running on workers, VAX computers and workstations) has been enhanced. Because the new client code is noticeably more robust than previous code and can take advantage of server enhancements, all users are highly encouraged to upgrade their software. The highlights of the changes are explained below.

- In the past, a STORE request would immediately lock up resources and then timeout if transmission did not begin within an 8-minute wait-time. Such a request is now queued until actual file transmission begins.
- A VERSION command, which displays the date of the client code, has been added. Entering “cfs version” in this case will display

cfs: Client version date: 07/17/95

- Some client exit codes have been changed to values more appropriate for controller use. For example, if the Nameserver is not responding, EX\_TEMPFAIL is issued, rather than EX\_NOHOST.
- Error messages have been improved, especially to help with the problem-determination of network problems.
- The mis-routing of STDOUT and STDERR in certain error situations has been corrected.

#### Online Documentation

Binaries have been provided for SUN 4.1.3, SUN Solaris, SGI, HP, AIX, MSDOS, and VMS. To use the new version you must mount the appropriate platform (those listed above) from the file server **icn-tools.lanl.gov** as **/usr/lanl**. The binaries are found in **/usr/lanl/bin**; the man page is found in **/usr/lanl/man/man1/cfs.1**.

Documentation on mounting software is contained on the Web in the path **<http://www.lanl.gov/welcome.html>** under Software Archive. After choosing your platform and operating system, select NFS documentation.

For more information please contact: Harry G. McGavran at (505) 667-4050 or **[hgm@lanl.gov](mailto:hgm@lanl.gov)**, or Tom D. Stup at (505) 665-4797 or **[tds@lanl.gov](mailto:tds@lanl.gov)**.



**HISTE (SUN, UNICOS, VMS)**

<b>Function</b>	Allows you to extract the decks you want to process from a previously created HISTORIAN program library.
<b>Change</b>	Updated to Version 4.4.013 with the following new directives. <ul style="list-style-type: none"> <li>DH    Display date and time the named entry was added to the library and last time modified. Format: DH name</li> <li>SA    Show all decks that have been modified by the named modification set. Format: SA mod-set-name</li> <li>SC    Show all decks that call the named common deck. Format: SC com-deck-name</li> <li>SM    Show all modification sets that have been applied to the named deck. Format: SM deck-name</li> <li>LN    List all definable names in the library. Format: LN</li> </ul>
<b>X File Access</b>	On CFS as: <b>/histx/hist4_9508.tar</b> for Sun workstations.  (If you cannot access the <b>/histx</b> directory, contact Marj Sigler at (505) 667-7309 or <b>mds@lanl.gov</b> .)  On CFS as: <b>/ccx/unicos/bin7/histex</b> for Machine Rho. On CFS as: <b>/ccx/unicos/bin8/histex</b> for Machine Gamma. On CFS as: <b>/ccxs/unicos/bin7/histex</b> for Machines Delta and Epsilon. On CFS as: <b>/ccx/vax/historn.bak</b> for VMS system managers.
<b>Online Documentation</b>	To display the man page (dated 6/92), enter: <b>man histe</b>
<b>Printed Documentation</b>	<i>HISTORIAN PLUS</i> (CIC#313, 1991, \$38)

**HISTG (SUN, UNICOS, VMS)**

<b>Function</b>	Allows you to compare an EDIT file with a HISTORIAN program library and generate a new library incorporating the changes.
<b>Change</b>	Updated to Version 4.4.013 with the following new directives. READ (RD) directive allowed in the edit file.
<b>X File Access</b>	On CFS as: <b>/histx/hist4_9508.tar</b> for Sun workstations.  (If you cannot access the <b>/histx</b> directory, contact Marj Sigler at (505) 667-7309 or <b>mds@lanl.gov</b> .)

## HISTG (Contd.)

### Online Documentation

### Printed Documentation

On CFS as: **/ccx/unicos/bin7/histgx** for Machine Rho.  
 On CFS as: **/ccx/unicos/bin8/histgx** for Machine Gamma.  
 On CFS as: **/ccxs/unicos/bin7/histgx** for Machines Delta and Epsilon.  
 On CFS as: **/ccx/vax/historn.bak** for VMS system managers.

To display the man page (dated 6/92), enter: **man histg**

*HISTORIAN PLUS* (CIC#313, 1991, \$38)

## HISTORN (SUN, UNICOS, VMS)

### Function

Allows you to create, store, and update a library of source codes or data.

### Change

Updated to Version 4.4.013 with the following new directives for SC, SS, RP, and RS.

- Set names can be used in scan directives:

\*SC setname,,/agpm/,/agpm1/

This will change the string **agpm** to **agpm1** in set setname.

- Scan will only apply to those decks which have been modified or selected by EDIT:

\*SC ../x1/,/x2/

\*D DECK4.23

\*E DECK1,DECK7

This will cause the string x1 to be changed to x2 in decks DECK1, DECK4.23 and DECK7, which were the only decks modified or selected by EDIT during this run.

MODSET (MS) directive replacing IDENT directive (Note: ID still allowed).

### X File Access

On CFS as: **/histx/hist4\_9508.tar** for Sun workstations.

(If you cannot access the /histx directory, contact Marj Sigler at (505) 667-7309 or **mds@lanl.gov**.)

On CFS as: **/ccx/unicos/bin7/histornx** for Machine Rho.

On CFS as: **/ccx/unicos/bin8/histornx** for Machine Gamma.

On CFS as: **/ccxs/unicos/bin7/histornx** for Machines Delta and Epsilon.

On CFS as: **/ccx/vax/historn.bak** for VMS system managers.

### Online Documentation

To display the man page (dated 6/92), enter: **man historn**

### Printed Documentation

*HISTORIAN PLUS* (CIC#313, 1991, \$38)

**LDB (UNICOS)**

<b>Function</b>	Interactive debugger and binary file editor.
<b>Change</b>	<p>This version for UNICOS 8.x will not automatically detect the file to debug as a restart file. To do this, you need to invoke the <b>-r</b> option on the command line.</p> <p><b>-r file</b>      Attach to the restart file specified. The <b>-n</b> (nocopy) option is enabled.</p>
<b>X File Access</b>	<p>No experimental (X) files. Currently available as: <b>/usr/local/bin/ldb</b> for Machines Gamma and Rho.</p>
<b>Online Documentation</b>	<p>To display the man page (dated 8/92), enter: <b>man ldb</b></p> <p>The <i>LDB Technical Reference Manual</i> (CIC#1789, 9/92) is contained on the Web in the path -</p> <p><a href="http://www.lanl.gov/computer-information/Documentation/technical/subject/Debugger/LDB/ldb">http://www.lanl.gov/computer-information/Documentation/technical/subject/Debugger/LDB/ldb</a> or from the LANL Home Page (<a href="http://www.lanl.gov/welcome.html">http://www.lanl.gov/welcome.html</a>) select the following:</p> <ul style="list-style-type: none"> <li>Computing at LANL</li> <li>Documentation</li> <li>Technical Documentation</li> <li>Subject Listing</li> <li>Debugger</li> <li>LDB</li> <li>LDB Technical Reference Manual</li> </ul>

**System Information**

This section provides information and a record of changes to the ICN operating systems. When changes are announced here, they may already be included in the production versions of the indicated operating systems and machines. Most of the changes are strictly internal to the systems and should not affect users. However, if you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov**.

**Machine Delta (UNICOS)**

On August 8, 1995, at 8:00 am Machine Delta's UNICOS operating system will be enhanced with a new CPU scheduler. This locally developed scheduler is described under "New Scheduling System for UNICOS" in this issue of BITS. Concurrent with the change, an enhanced version of **inquiry** will also be installed on Delta. The new **-b** option to **inquiry** will allow users to monitor the progress of their jobs, and the effectiveness of the new scheduler.

## Machine Delta (Contd.)

Example

Resource Bank Name = CIC							
			SYSTEM	ALLOCATED	USED	IDLE	
CPUs			8	1.53	1.38	0.00	
MegaWords			57.65	11.09	9.05	9.27	
USER	PID	NICE	CPU%	SIZE	TIME_USED	TTY:PROCESS_STATUS	
rmk	[ 26601]	30	33%	1.47MW	CPU= 3:07:01*	p079:ldb	RUNNING on CPU 3
rxl	[ 48740]	30	53%	0.85MW	CPU= 2:19:16*	p026:exax	IN MEMORY
jhw	[ 44272]	30	49%	4.26MW*	CPU= 1:57:00*	p065:mc	IN MEMORY

“inquiry -b [bank ...]” shows performance statistics for the specified resource banks, or, if none are given, the current resource bank. Statistics for the bank and its processes are updated every 4 seconds. ALLOCATED refers to the resources that should be given to this bank based on its configured share of the system; USED refers to the resources consumed by the bank during the last time interval; IDLE refers to system-wide resources. Processes running in the bank are listed in order of total time used; CPU% refers to the fraction of a single CPU used during the time interval.



## UNICOS Operating System

A team has been formed to investigate reports of poor response problems on UNICOS. All poor response problems will be investigated immediately and user(s) reporting the problem(s) will be notified of the results. Within 24 hours after a problem is reported, a news item summarizing the results will be posted on the machine where the problem occurred.

To report poor response problems on UNICOS, the team can be contacted as follows (in order of preference):

ICN Consulting Office at (505) 667-5746 or unicos team at **cic\_swat@lanl.gov** (this mail alias is available in the open environment only).

UNICOS on-call pager (Digital): (505) 989-0443

## Documentation

### New and Updated Man Pages

The following online information has been added or updated.

#### UNICOS Man Pages

To access a UNICOS man page, enter: **man** *command\_name*, where *command\_name* is the name of the command, library, routine, or utility whose man page you wish to view.

Man Page	Description
<b>support</b>	This is an index of software that is obtained from third party vendors and is made available on ULTRIX, UNICOS, or UNIX systems in the ICN. This software is not supported by CIC Division but rather by an individual referred to as the maintainer.

To create ASCII files of the UNICOS man pages, use the following command to remove the special characters for bold and underlining:

UNICOS 7.0 and 8.0: **man** *command\_name* | **col -bx** > *filename*

Barbara Ritchie (**bxr@lanl.gov**), (505) 667-7275  
Communication Arts and Services (CIC-1)

## Information About Change Control

ICN Change Control is the set of procedures that coordinates changes in the ICN to ensure quality control and smooth operation and to avoid introducing additional problems. In an environment as dynamic as the ICN, control must be imposed on the scope and timing of changes that involve many components. Please report any problems as soon as they occur by calling the ICN Consulting Office at (505) 667-5746.

The following CFS nodes are used for software that is maintained or announced through Change Control procedures. The files under **/ccx(s)/unicos** are deleted the last Friday of each month because these experimental versions become the production versions on all machines by the third Tuesday of the month. The other nodes keep the most recent versions of their respective software.

Non-UNICOS Systems	<i>/cc-node/platform/filename</i>
UNICOS Systems	<i>/cc-node/unicos/type/filename</i>

Where *cc-node* is:

**ccx**

Open change-control root node

examples: **/ccx/mac/ppages**  
**/ccx/unicos/bin7/ppagesx**  
**/ccx/unicos/ubin7c/tedix**  
**/ccx/vax/ppages.bak**

**ccxs**

Secure change-control root node

examples: **/ccxs/unicos/lib8/libcftlib.a**  
**/ccxs/sun/ppages.tar**

Where *platform* is:

**alpha\_osf**

tar files for DEC Alpha OSF/1 machines

**alpha\_vms**

backup save sets for DEC Alpha VMS machines

**convex**

tar files for Convex machines

**dec\_risc**

tar files for DEC RISC workstations

**dos**

executables (**.exe**) for PC/DOS machines

**hp**

tar files for Hewlett-Packard workstations

**ibm\_rs6000**

tar files for IBM RS6000 workstations

**mac**

binhex (**.hqx**) or MacBinary (**.mbin**) files for Macintosh computers

**next**

tar files for NeXT workstations

**sgi**

tar files for Silicon Graphics workstations

**solaris**

tar files for Sun Solaris workstations

**sun**

tar files for Sun OS workstation

**ultrix**

current executables to test on Beta

**unicos**

executable **X** files or library files for current Change Control cycle

**vax**

backup-save-sets for VAX/VMS systems

Where *type* is:

**bin#**

binary files for version # of the operating system; note that an "x" is appended to the binary filenames.

**lib#**

library files for version # of the operating system

**u**

user-supported executable files (**ex**, **ubin**, **ulib**, **udata**, **usys**)

If problems are discovered during the cycle, defective hardware or software is corrected, replaced, removed, or backed off.



## Online Information

You can access complete online information about Change Control by using a web browser. You may contact the Customer Service Center at (505) 665-4444 or **cichelp@lanl.gov** for assistance.

From the LANL Home Page (<http://www.lanl.gov/welcome.html>) select Computing at LANL (<http://www.lanl.gov/computer-information>). Select the following series of options from the menu:

- BITS: Computing & Communications News
  - Connect directly to the BITS Home Page  
[http://www.lanl.gov/computer-information/ComputingNews/bits\\_homepage.html](http://www.lanl.gov/computer-information/ComputingNews/bits_homepage.html)
- Scroll down the Home Page to BITS: ICNchanges  
 You will get a new menu. Select the next menu that reflects your needs.
  - Keyword Search of all ICNchanges (?)
  - Current Issue
  - 1995 Archives through 1991 Archives

Or from the LANL Home Page/Computing at LANL. Scroll down and select ICNchanges (<http://www.lanl.gov/computer-information/ICNchanges>):

- ICNchanges  
 You will get a new menu. Select the next menu that reflects your needs.
  - Keyword Search of all ICNchanges (?)
  - Current (*month year*)
  - 1995 Archives through 1991 Archives
- For example, select "Current August 1995" to get a list of the articles for the current month's Change Control. You will get a new menu. Select the next menu that reflects your needs.

BITS: ICNchanges - ASCII Version  
 BITS: ICNchanges - HTML Version  
 BITS: ICNchanges - Acrobat Version  
 BITS: ICNchanges - PostScript Version

*Barbara Ritchie (bxr@lanl.gov), (505) 667-7275*  
*Communication Arts and Services (CIC-1)*

## SEPTEMBER DEADLINE

The deadline for articles for the September 1995 Change Control is 8:00 am. Monday, August 21, 1995. Please submit items to **bulletin@lanl.gov**.



## CCF Machine Availability and Downtime

Machine Name(s)	Machine Type	Operating System	Security Partition	System Availability (June 1995)	Scheduled Downtime*
delta	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	98.9%	August 2/30 — 0400-0700
epsilon	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	98.8%	August 16 — 0400-0700
rho	CRAY Y-MP8/8-64	UNICOS 7.0	Open	98.8%	August 16 — 0400-0700
zeta	CRAY Y-MP8/2-64	UNICOS 8.0	Secure	99.0%	August 23 — 0400-0700
gamma	CRAY Y-MP/M98-82048	UNICOS 7c	Open	97.7%	August 23 — 0400-0700
tau**	CRAY T3D MC512-8	MAX 1.2	Secure	96.5%	August 2/30 — 0400-0700
	CRAY Y-MP4I/464-2	UNICOS 8.0			
pi**	CRAY Y-MP EL92/1-256	UNICOS 8.0	Open	100%	
cluster	IBM Workstation Cluster	AIX	Open		
beta	VAX 6320	ULTRIX	Open		
CCVAX	VAX 6410	VMS	Open		
OFVAX	VAX 6410	VMS	Open		
canyon	Thinking Machines Corp. CM-200	SunOS	Secure		
tres	Thinking Machines Corp. CM-200	SunOS	Secure		

\* Additional downtime for the Cray machines may occur as a result of Network Dedicated Systems Time (NDST). The schedule for possible NDST is from 0600-0700 Mountain Time, Monday through Friday. Should NDST become necessary, a message listing the scheduled downtime will be broadcast on the applicable machines before the actual downtime occurs. For additional information contact the shift supervisor at (505) 667-4584. All times listed are Mountain Time.

\*\* Access restricted.

## Questions About Announced Changes?

Notice of all scheduled downtime will be broadcast on the machine before the downtime. For up-to-date machine status and scheduled downtime call: CCF Status Message (505) 667-5588.

## Publication Information

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Mail Stop B252  
Telephone (505) 667-7309

## Advanced Computing Laboratory

When first founded, the Advanced Computing Laboratory (ACL) was intended to provide an applications-driven environment for developing leading edge computing technologies, primarily in the areas of parallel and distributed computing, scientific visualization, and high-speed networking.

In December 1991, Los Alamos National Laboratory was named as one of two national HPCRC (High-Performance Computing Research Center) sites by the Department of Energy's HPCC (high-performance computing and communications) program. The ACL is the foundation upon which this center is being built. The mission of the ACL is to facilitate solution of tomorrow's complex, interdisciplinary problems in science, industry, and defense. This will be accomplished by focusing on a few Grand Challenge-scale applications, providing a unique simulation environment and advanced computational resources, having a world-class staff, and forging links with other centers of excellence.

The resources of the ACL are available to LANL employees with a demonstrated need for the unique resources that the ACL provides. In addition, industrial collaborators may seek access through a partnership with the Laboratory, which can be arranged through the Computational Testbed for Industry (CTI). Under the auspices of the DOE Grand Challenge program, other external researchers involved in the LANL-based Grand Challenge projects may also seek access. An ACL account application form is available by sending e-mail to [proposal@acl.lanl.gov](mailto:proposal@acl.lanl.gov). The only payment the ACL requests for use of its resources is a copy of any paper or other publication with ACL acknowledgment in the publication.

## ACL Machine Availability

Machine Type	Operating System	Security Partition	Machine Name(s)
FPS350X (Stardent GS2000)	STELLIX	Open	stella
FPS500	FPX	Open	blanche
ibm930	AIX	Open	ibm930
Intel iWARP	SunOS	Open	iwarp
Motorola Monsoon	SVR2	Open	monsoon
SGI ONYX	SVR3	Open	black
SGI 380VGX	SVR3	Open	panda
IBM 550	AIX	Open	noid
Thinking Machines Corp. Connection Machine CM-5*	SunOS	Open	cm5-1 to cm5-8
CRI T3D*	UNICOS 80	Open	T3D
Sun 4/670	SunOS	Open	koala
Sun 4/670	SunOS	Open	cocker
Sun 4/670	SunOS	Open	collie
Sun 4/670	SunOS	Open	pooh
* Special access rules apply.			

## Accessing Computing Machines through the ICN

*This table shows how to access open machines on the ICN through MICOM lines, TCP/IP hosts, and DECnet hosts. Additional machines outside the ICN are accessible through TCP/IP and DECnet. To access any of these machines, except for LIS, you must first establish an ICN account, which includes obtaining an ICN password and registering as an ICN user (contact the CIC Customer Service Center for details).*

*Example: Suppose you want to access the REGISTER machine from MICOM. By referring to the table, you can see that the appropriate command to enter is TIG. Once you connect to the TIG, enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter register and login to the register machine.*

TO →	Hosts reachable from MICOM Lines: (BETA, CANyon, CCVAX, TYMNET, LIS)	TCP/IP Hosts: (BETA, CCVAX, IBM Cluster, IOVAX, OFVAX, REGISTER, UNICOS, ACL Hosts, etc.)
FROM ↓		
MICOM Lines	hostname	TIG TELNET hostname
TCP/IP Hosts (e.g., TIG)	TELNET MICOM hostname	TELNET hostname

## Accessing the ICN through Dialup Modem

*Dialup access to the ICN is available through the Terminal Internet Gateway (TIG). The TIG is a gateway to the internet and allows you to telnet to ICN machines as well as other machines. Configure your modem and terminal for 8 bit, no parity, one stop bit. Based on your modem, select the appropriate number listed in the table to dial into the TIG. Then enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter a machine name or IP address.*

*Report problems to the Network Control Center at 667-7423 Monday through Friday, 6 am to 6 pm or at 667-4585 during non-business hours.*

Type of Access	Phone Numbers
Microcom Modems from 300 to 28,800 b/s	(505) 667-9020, 9021, 9022, 9023 (Number of Lines: 16) (800) 443-1461 (Number of Lines: 10)
Microcom Modems from 300 to 14,400 b/s	(505) 667- 9024 and 9025 (Number of Lines: 48)
Note: Use the next phone number if the first does not answer properly.	
Revised August 1995	

## DSC Macintosh Software Order Form

All software listed below, except Netscape, is available at no cost (Netscape costs \$30.00). To order software, fill in the blanks below, check the software you would like to have, and mail this form to

Free Software

Desktop Support Center (CIC-2) MS D445

Name \_\_\_\_\_ Group \_\_\_\_\_

Mail Stop \_\_\_\_\_ Z-Number \_\_\_\_\_

Cost Code \_\_\_\_\_ Program Code \_\_\_\_\_ Account Package \_\_\_\_\_

Please send the correct number of replacement high-density diskettes with your request. If you don't send any disks, we will send you the software with the understanding that you will return the diskettes after you copy the software.

### FREEWARE DISKETTE (Include one high-density diskette.)

This diskette contains the following software:

**Alias Finder:** Quickly finds the original of an alias when the alias is dragged on top of the Alias Finder icon.

**Disinfectant:** Virus protection for the Macintosh.

**Disk Copy:** Creates copies of diskettes using one floppy drive.

**SCSI Probe:** Shows connected devices on the SCSI bus.

**StuffIt Expander:** Unstuffs BinHex 4.0, StuffIt, and other types of compressed files.

### INTERNET DISKETTE (Include one high-density diskette.)

This diskette contains the following software:

**Fetch:** Easy-to-use for FTPing files from FTP archives.

**NCSA Telnet:** Telnet application

**TurboGopher:** Gopher client application for the Macintosh.

**StuffIt Expander:** Unstuffs BinHex 4.0 and other types of compressed files.

### MACINTOSH SYSTEM 7.5 (Include nine high-density diskettes.)

Indicate number of systems on which this System 7.5 will be used: \_\_\_\_\_

*Note: System 7.5 Manuals are available for \$7.50. Enter your accounting information above. CD-ROM version available for free loan. Call 5-1361 for details.*

### SYSTEM 7.5 POWERTALK AND QUICKDRAW GX. (Include four high-density diskettes.)

*Note: We recommend that you do not install these parts of System 7.5 unless you have a specific need to do so.*

### SYSTEM 7.5 UPDATE, VERSION 1.0 (Include 5 high-density diskettes.) Updates System 7.5, fixes some bugs, speeds up file-sharing, new printer software, etc. Includes Network Software Installer 1.5.

### NETSCAPE (Include one high-density diskette.)

Netscape is a commercial web browser. Even though it is available on the Internet, it is not free. CIC-2 has bought 1,000 copies of Netscape for a cost of \$30.00 per copy. Enter your accounting information above. We will include a license certificate indicating your purchase.

### ACROBAT READER (Include one high-density diskette.)

Multi-platform document viewer. Used with viewing "pdf" documents on the LANL web server and fast becoming an Internet standard.

### ACROBAT EXCHANGE (Include four high-density diskettes.)

An enhanced version of the Acrobat Reader. Allows you to create and annotate "pdf" files as well as read them. Note: CIC Division bought a license of 1,000 copies of Acrobat Exchange. We do not charge for this software but can only distribute 1,000 copies of it (both Mac and PC).

Indicate the number of systems on which this copy of Acrobat Exchange will be used: \_\_\_\_\_

### JETFORM FILLER (Include four high-density diskettes.)

Form-based document software for use with the LANL's Web server on-line forms.

Note: CIC-13 bought a license for 2,000 copies. We do not charge for this software but can only distribute 2,000 copies.

Indicate the number of systems on which this copy of Jetform Filler will be used: \_\_\_\_\_

CUT ALONG DASHED LINE

All software listed below, except Netscape, is available at no cost (Netscape costs \$30.00). To order software, fill in the blanks below, check the software you would like to have, and mail this form to

Free Software

Desktop Support Center (CIC-2) MS D445

Name \_\_\_\_\_ Group \_\_\_\_\_

Mail Stop \_\_\_\_\_ Z-Number \_\_\_\_\_

Cost Code \_\_\_\_\_ Program Code \_\_\_\_\_ Account Package \_\_\_\_\_

Please send the correct number of replacement high-density diskettes with your request. If you don't send any disks, we will send you the software with the understanding that you will return the diskettes after you copy the software.

\_\_\_\_\_ **DATA PHYSICIAN** Virus detection programs. (Include one high-density diskette.)

\_\_\_\_\_ **INTERNET DISKETTE** (Include one high-density diskette.)

lview31	A gif/bmp/pic viewer.
tsyncl>8	Set up your pc clock via LANL ftp timeserver automatically.
WS_Ftp	Super ftp client.
WS_Ping	Super ping and nslookup.
pkunzip	File decompression program.

\_\_\_\_\_ **NETSCAPE** (Include one high-density diskette.)

Netscape is a commercial web browser. Even though it is available on the Internet, it is not free. CIC-2 has bought 1,000 copies of Netscape for a cost of \$30.00 per copy. Enter your accounting information above. We will include a license certificate indicating your purchase.

\_\_\_\_\_ **ACROBAT READER** (Include one high-density diskette.)

Multi-platform document viewer. Used with viewing "pdf" documents on the LANL web server and fast becoming an Internet standard.

\_\_\_\_\_ **ACROBAT EXCHANGE** (Include four high-density diskettes.)

An enhanced version of the Acrobat Reader. Allows you to create and annotate "pdf" files as well as read them. Note: CIC Division bought a license of 1,000 copies of Acrobat Exchange. We do not charge for this software but can only distribute 1,000 copies of it (both Mac and PC). Indicate the number of systems on which this copy of Acrobat Exchange will be used: \_\_\_\_\_

\_\_\_\_\_ **JETFORM FILLER** (Include five high-density diskettes.)

Form-based document software for use with the LANL's web server on-line forms. Note: CIC-13 bought a license of 2,000 copies of Jetform Filler. We do not charge for this software but can only distribute 2,000 copies of it (Mac version available soon). Indicate the number of systems on which this copy of Jetform Filler will be used: \_\_\_\_\_

# INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

Mail your completed application to:  
ICN Password Office (PWO)  
Mail Stop: B271  
Los Alamos National Laboratory  
Los Alamos, NM 87545

If you have questions: Call: (505) 665-1805  
E-mail: validate@lanl.gov

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

## Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

**Check LANL affiliation:**

☐ LANL employee

☐ Contractor \_\_\_\_\_  
(specify contract company)

☐ Consultant, VSM, associate

☐ External user \_\_\_\_\_  
(specify employer)

☐ Other (specify) \_\_\_\_\_

Send password / smartcard to:

☐ Mail Stop or ☐ Mail to address indicated below

Name / Organization \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

## Access Check access method and needed partitions:

**Access method:** ☐ ICN Password ☐ Smartcard ☐ Both

☐ Open partition (e.g., email systems, open machines)

☐ Administrative partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS] )  
If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.

☐ Secure partition (i.e., secure machines )  
Indicate level(s) of data to be processed:

☐ Unclassified

☐ Secret

I certify this person does require secure access:

\_\_\_\_\_  
Manager Signature (Group Leader or above)

\_\_\_\_\_  
Date

**NOTE:** A Q-clearance is required. All classified computing must be performed within the Secure environment.

## PWO Use Only

New <input type="checkbox"/>	Change <input type="checkbox"/>	Clearance Status	Processed	Ly	Smartcard Serial #
Comments:					

## Special Requirements

<b>Administrative Partition</b>			
(U.S. Citizens Only)	Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])		
<input type="checkbox"/> Under 18 years of age	If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition.		
<input type="checkbox"/> Contractor or Non-Q-Cleared	Phone (505) 667-9444 to obtain Access Authorization packet. Phone (505) 667-9153 to schedule a security briefing. Bring all forms including this ICN Validation Request to the security briefing for approval.		
<table border="1" style="width: 100%;"> <tr> <td style="width: 70%;">Security Briefing Approval Signature</td> <td style="width: 30%;">Date</td> </tr> </table>		Security Briefing Approval Signature	Date
Security Briefing Approval Signature	Date		

<input type="checkbox"/> Foreign National Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN.
---

## Authorization (required)

Print Manager Name (Group Leader or above)	Manager Z-Number	Group
Manager Signature (Group Leader or above)	Mail Stop	Date

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.  
 NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature	Mail Stop	Date	



## Reader Feedback

Feedback helps us to provide a document that responds to the changing needs of its readership. If you have comments or questions about this publication, please let us hear from you. We have reserved the back of this form for that purpose. We also accept articles for publication that are of interest to our readers. Contact the managing editor for more information. This form is also used for new subscriptions, deletions, or changes. Instructions are on the back. If you prefer to contact us by E-mail, send your comments and/or subscription request to [finney@lanl.gov](mailto:finney@lanl.gov).

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LOS ALAMOS NM 87544-9916



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## Feedback

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### New Subscriptions, Deletions, and Changes

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## Questionnaire for BITS

Please answer the questions and return this form by August 18, 1995. Thank you.

1. Indicate whether BITS sufficiently addresses the computing areas within CIC Division (circle one).

Coverage is sufficient      Coverage is insufficient

2. If BITS needs to address more computing areas, list the areas that need to be added. \_\_\_\_\_

3. If BITS needs to address fewer computing areas, list the areas that should be eliminated. \_\_\_\_\_

4. Indicate whether the scope of BITS should remain focused on computing areas or expanded to address additional areas within CIC Division (circle one).

Limit scope      Expand scope

5. If the scope of BITS should be expanded, list the areas that should be added. \_\_\_\_\_

6. Listed below are the types of articles and information that have been published in BITS over the past year. On a scale of 1 to 10 (with 10 as the highest), rate the importance and effectiveness of each type.

a. Articles that spotlight Laboratory projects and CIC's role in those projects (e.g., Human Genome Project, Los Alamos Waste Management, Transportation Analysis Simulation System, Library Without Walls, Sunrise, Information Architecture, National Information Infrastructure, and Computational Testbed for Industry).

Importance \_\_\_\_ Effectiveness \_\_\_\_

b. Articles that provide suggestions for more efficient use of CIC products and services (e.g., Suggestions for Summer Computer Users, Description of CIC Consultants, Suggestions for using the Central Computing Facility, Suggestions for using Desktop Computers, and Suggestions for using Administrative Computer Systems).

Importance \_\_\_\_ Effectiveness \_\_\_\_

c. Articles that evaluate commercial or CIC supported products and services (e.g., Eudora, System 7.5 for Macs, Netscape, PVM software, MPI software, Lotus Notes, UNICOS 8.0, Microsoft Word 6.0, The Power Macintosh, C++ programming language, Smartcards, and Cray CF90 Programming Environment).

Importance \_\_\_\_ Effectiveness \_\_\_\_

d. Articles that inform CIC employees and customers about important developments in CIC operations (e.g., Modifications to OFVAX ALL-IN-ONE E-mail System, Recommendations for Locally Developed Software, Availability of Secure Computing on the Cluster Workstations, and Implementation of the ICN2 and LAICS projects).

Importance \_\_\_\_ Effectiveness \_\_\_\_

e. ICNchanges: Monthly updates for hardware and software changes on the Integrated Computing Network (ICN).

Importance \_\_\_\_ Effectiveness \_\_\_\_

f. In the Classroom: Monthly listing and description of the computer training offered by CIC.

Importance \_\_\_\_ Effectiveness \_\_\_\_

g. Miscellaneous Material: Forms, Schedules, and Index.

Importance \_\_\_\_ Effectiveness \_\_\_\_

7. BITS is now available on line in four different formats. Circle the ones you can access.

ASCII      PostScript  
Acrobat      HTML

8. On a scale of 1 to 10 (with 10 as the highest) rate the importance and, if you have accessed the format, the effectiveness of each.

a. ASCII:      Importance \_\_\_\_ Effectiveness \_\_\_\_  
b. PostScript:      Importance \_\_\_\_ Effectiveness \_\_\_\_  
c. Acrobat:      Importance \_\_\_\_ Effectiveness \_\_\_\_  
d. HTML:      Importance \_\_\_\_ Effectiveness \_\_\_\_

## Why Another BITS Questionnaire?

Just over a year ago we published the first issue of BITS, which replaced the old C Division News. Before publishing BITS we surveyed the readership to help us understand how to best serve that readership. (Results of that survey were published in the March 1994 issue of BITS.) The current style, content, and format of BITS are based on the results of that survey and other feedback we've received since then. To ensure that BITS continues to reflect the current needs of its readership, we have developed another survey. The survey questions are on the back of this form.

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